

**REFLECTOR ANTENNA SYSTEM INCLUDING A PHASED ARRAY ANTENNA
OPERABLE IN MULTIPLE MODES AND RELATED METHODS**

Abstract of the Disclosure

A reflector antenna system may include an arc-shaped antenna reflector defining a first antenna beam, and a phased array antenna positioned in the first antenna beam including first and second arrays of antenna elements coupled together in back-to-back relation. The first array may face the antenna reflector, and the second array may face away from it. A controller switchable between a reflecting mode and a direct mode may be connected to the arrays. The controller, when in the reflecting mode, may cause back-to-back pairs of first antenna elements from the arrays to define a feed-through zone for the first antenna beam, and cause second antenna elements in the first array to define a first active zone for the first antenna beam. Furthermore, when in the direct mode, the controller may cause antenna elements in the second array to define a second active zone for a second antenna beam.